

LPDES PERMIT NO. LA0003638, AI No. 2720

LPDES FACT SHEET and RATIONALE
FOR THE DRAFT LOUISIANA POLLUTANT DISCHARGE ELIMINATION SYSTEM
(LPDES) PERMIT TO DISCHARGE TO WATERS OF LOUISIANA

- I. **Company/Facility Name:** Mosaic Fertilizer, LLC
Taft Plant
7250 Highway 44
Uncle Sam, LA 70792
- II. **Issuing Office:** Louisiana Department of Environmental Quality
(LDEQ)
Office of Environmental Services
Post Office Box 4313
Baton Rouge, Louisiana 70821-4313
- III. **Prepared By:** Bruce Fielding
Industrial Permits Section
Water Permits Division
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Date Prepared: November 19, 2009

IV. **Permit Action/Status:**

A. Reason For Permit Action:

Proposed reissuance of an expired Louisiana Pollutant Discharge Elimination System (LPDES) permit for a 5-year term following regulations promulgated at LAC 33:IX.2711/40 CFR 122.46.

LAC 33:IX Citations: Unless otherwise stated, citations to LAC 33:IX refer to promulgated regulations listed at Louisiana Administrative Code, Title 33, Part IX.

40 CFR Citations: Unless otherwise stated, citations to 40 CFR refer to promulgated regulations listed at Title 40, Code of Federal Regulations in accordance with the dates specified at LAC 33:IX.2301.F, 4901, and 4903.

- B. LPDES permit - LPDES permit effective date: March 1, 2004
LPDES permit modification effective date: May 1, 2005
LPDES permit modification effective date: November 1, 2005
LPDES permit expiration date: February 28, 2009
EPA has not retained enforcement authority.
- C. Application received on August 29, 2008, addendum received on November 19, 2008, email submitted on November 20, 2009, from Mosaic Taft (Chatelain) to LDEQ (Loyd), and addendum received on January 27, 2010.

Fact Sheet and Rationale for
Mosaic Fertilizer, LLC, Taft Plant
LA0003638, AI No. 2720
Page 2

V. Facility Information:

A. Location - 17245 River Road in Hahnville

B. Applicant Activity -

According to the application, Mosaic Fertilizer, LLC, Taft Plant, is a fertilizer manufacturer and manufactures Diammonium Phosphate (DAP). The facility is currently idle. When operating, the Taft Plant receives phosphoric acid, sulfuric acid, and ammonia as raw materials. The phosphoric acid and ammonia are blended in a pre-neutralization tank where they form diammonium phosphate. The sulfuric acid is used for pH control in the blending process. The diammonium phosphate is pumped in slurry form to the granulation unit for crystallization into DAP granules for sale.

Similar to the previous permit, the facility shall continue to meet all permit limits and monitoring requirements at all times, including when the facility is idle.

C. Technology Basis - (40 CFR Chapter 1, Subchapter N/Parts 401-402, and 401, 405-415, and 417-471 have been adopted by reference at LAC 33:IX.4903)

Guideline

Reference

Fertilizer Manufacturing
(Phosphate Subcategory)

40 CFR 418 Subpart A, BPJ

Fertilizer Manufacturing
(Mixed & Blend Fertilizer Production
Subcategory)

40 CFR 418 Subpart G, BPJ

Other sources of technology based limits:

LDEQ Stormwater Guidance, letter dated 6/17/87, from J. Dale Givens (LDEQ) to Myron Knudson (EPA Region 6).

Best Professional Judgement

Previously effective (3/1/2004) LPDES permit

D. Fee Rate -

1. Fee Rating Facility Type: Major
2. Complexity Type: VI
3. Wastewater Type: II
4. SIC code: 2874

Fact Sheet and Rationale for
Mosaic Fertilizer, LLC, Taft Plant
LA0003638, AI No. 2720
Page 3

E. Estimated Average Facility Effluent Flow (Max 30-Day) - 3.02 MGD.

VI. Receiving Waters: Mississippi River

1. TSS (15%), mg/L: 26.6
2. Average Hardness, mg/L CaCO_3 : 149.7
3. Critical Flow, cfs: 141,955
4. Mixing Zone Fraction: 1/3
5. Harmonic Mean Flow, cfs: 366,748
6. River Basin: Mississippi River, Subsegment No. 070301
7. Designated Uses:
The designated uses are primary contact recreation,
secondary contact recreation, fish and wildlife propagation,
and drinking water supply.

Information based on the following: LAC 33:IX Chapter
11;/Recommendation(s) from Todd Franklin, November 10, 2009.
Hardness and 15% TSS data come from monitoring station 321 on the
Mississippi River listed in Hardness and TSS Data for All LDEQ
Ambient Stations for the Period of Record as of March 1998,
LeBlanc. See recommendations at Appendix B.

VII. Outfall Information:

Outfall 002

- A. Type of wastewater - final combined effluent from Internal Outfalls 102 and 202.
- B. Location - at the point of discharge from the final outfall prior to discharge to the Mississippi River at Latitude 29°59'20", Longitude 90°27'25".
- C. Treatment - none
- D. Flow - Intermittent, (Estimated Average) 1.420 MGD
- E. Receiving waters - Mississippi River
- F. Basin and Subsegment - Mississippi River Basin, Subsegment 070301

Internal Outfall 102

- A. Type of wastewater - stormwater runoff from the inactive calcium sulfate storage pile, and stormwater that has infiltrated the inactive calcium sulfate storage pile.

Fact Sheet and Rationale for
Mosaic Fertilizer, LLC, Taft Plant
LA0003638, AI No. 2720
Page 4

- B. Location - at the point of discharge prior to entering the intake sump of the Outfall 002 pump prior to discharge to the Mississippi River at Latitude 29°59'16", Longitude 90°27'37".
- C. Treatment - None
- D. Flow - Intermittent, (Estimated Average) 1.292 MGD
- E. Receiving waters - Mississippi River via Final Outfall 002
- F. Basin and Subsegment - Mississippi River Basin, Subsegment 070301

Internal Outfall 202

- A. Type of wastewater - discharge of contaminated stormwater runoff from the phosphate fertilizer production area (when not operating), and (*1).
- B. Location - at the point of discharge of the Internal Outfall 202 pump or the Internal Outfall 202 overflow weir (whichever is flowing) prior to discharge to the Mississippi River at Latitude 29°59'17", Longitude 90°27'37".
- C. Treatment - None
- D. Flow - Intermittent, (Estimated Average) 0.806 MGD
- E. Receiving waters - Mississippi River via Final Outfall 002
- F. Basin and Subsegment - Mississippi River Basin, Subsegment 070301

(*1) The requirements of 40 CFR 418.72/418.73 are established for effluent limitations for the permittee's diammonium phosphate production facility.

VIII. Proposed Permit Limits:

The specific effluent limitations and/or conditions will be found in the draft permit. Development and calculation of permit limits are detailed in the Permit Limit Rationale section below.

Summary of Proposed Changes From the Current LPDES Permit:

- A. The permittee has requested removal of the following parameters from Outfall 002: Total Kjeldahl Nitrogen, Nitrates/Nitrites, Sulfate, Total Dissolved Phosphorous, Gross Alpha Particle Activity, Total Radium, Total Uranium, Toxic Priority Metals, Total Aluminum, and Total Cadmium.

Fact Sheet and Rationale for
Mosaic Fertilizer, LLC, Taft Plant
LA0003638, AI No. 2720
Page 5

The permittee's request is denied. There is still reasonable potential to discharge these parameters even though recent loadings have been low and/or compliance history has been good. However, this Office shall grant monitoring frequency reductions from 1/week to 1/month for Gross Alpha Particle Activity, Total Uranium, Total Aluminum and Total Cadmium due to good compliance record for these parameters. Monitoring frequency reduction from 3/week to 1/week is granted for Sulfate. Monitoring frequencies for the other parameters requested for deletion shall remain the same as previously permitted to provide representative sampling.

- B. The permittee requests monitoring frequency reductions from 3/week to 1/week for the following parameters at Outfall 002; TSS, Fluoride, Total Phosphorous, Flow weekly volume & Internal Outfall 102, and Dock Discharges (as P).

This Office partially concurs with the permittee's request. Monitoring frequency reductions from 3/week to 1/week shall be granted for the following parameters; TSS, Fluoride, Total Phosphorous, and Dock Discharges (as P). Flow weekly volume & Internal Outfall 102, was continued at 1/day when discharging.

- C. The permittee requests monitoring frequency reductions from 3/week to 1/week for the following parameters at Internal Outfall 102; pH, TSS, COD, Oil and Grease, Fluoride, Total Phosphorous, and Ammonia.

This Office partially concurs with the permittee's request. Monitoring frequency reductions from 3/week to 1/week shall be granted for the following parameters; pH, TSS, Oil and Grease, Fluoride, Total Phosphorous, and Ammonia. COD shall be maintained at 3/week due to permit excursions within the past 2 years. Flow shall also be maintained at 3/week.

- D. The permittee requests monitoring frequency reductions from 3/week to 1/week for the following parameters at Internal Outfall 202; Flow, pH, COD, Oil and Grease, Fluoride, Total Phosphorous, and Ammonia.

This Office partially concurs with the permittee's request. Monitoring frequency reductions from 3/week to 1/week shall be granted for the following parameters; COD, Oil and Grease, Fluoride, Total Phosphorous, and Ammonia. pH shall be maintained at 3/week due to permit excursions within the past 2 years. Flow shall also be maintained at 3/week.

Fact Sheet and Rationale for
 Mosaic Fertilizer, LLC, Taft Plant
 LA0003638, AI No. 2720
 Page 6

IX. Permit Limit Rationale:

The following section sets forth the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit. Also set forth are any calculations or other explanations of the derivation of specific effluent limitations and conditions, including a citation to the applicable effluent limitation guideline or performance standard provisions as required under LAC 33:IX.2707/40 CFR Part 122.44 and reasons why they are applicable or an explanation of how the alternate effluent limitations were developed.

A. TECHNOLOGY-BASED VERSUS WATER QUALITY STANDARDS-BASED EFFLUENT LIMITATIONS AND CONDITIONS

Following regulations promulgated at LAC 33:IX.2707.L.2.b/40 CFR Part 122.44(l)(2)(ii), the draft permit limits are based on either technology-based effluent limits pursuant to LAC 33:IX.2707.A/40 CFR Part 122.44(a) or on State water quality standards and requirements pursuant to LAC 33:IX.2707.D/40 CFR Part 122.44(d), whichever are more stringent.

B. TECHNOLOGY-BASED EFFLUENT LIMITATIONS AND CONDITIONS

Regulations promulgated at LAC 33:IX.2707.A/40 CFR Part 122.44(a) require technology-based effluent limitations to be placed in LPDES permits based on effluent limitations guidelines where applicable, on BPJ (best professional judgement) in the absence of guidelines, or on a combination of the two. The following is a rationale for types of wastewaters. See outfall information descriptions for associated outfall(s) in Section VII. Regulations also require permits to establish monitoring requirements to yield data representative of the monitored activity [LAC 33:IX.2715/40 CFR 122.48(b)] and to assure compliance with permit limitations [LAC 33:IX.2707.I./40 CFR 122.44(I)].

1. Outfall 002 - the intermittent discharge of the final combined effluent from Internal Outfalls 102 and 202.

Mosaic Fertilizer, LLC, Taft Plant is subject to Best Practicable Control Technology Currently Available (BPT) and Best Available Technology Economically Achievable (BAT) effluent limitation guidelines listed below:

Manufacturing Operation

Guideline

Fertilizer Manufacturing(Phosphate Subcategory) 40 CFR 418 Subpart A, BPJ

Fertilizer Manufacturing
 (Mixed and Blend Fertilizer Production
 Subcategory)

40 CFR 418 Subpart B, BPJ

Fact Sheet and Rationale for
Mosaic Fertilizer, LLC, Taft Plant
LA0003638, AI No. 2720
Page 7

Inactive Calcium Sulfate Storage Pile Excess Stormwater Runoff

PARAMETER(S)	MASS, LBS/DAY unless otherwise stated		CONCENTRATION, MG/L unless otherwise stated		MEASUREMENT FREQUENCY
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	
Flow, MGD	Report	Report	---	---	Continuous
pH Range Excursions No. of Events >60 minutes	---	0 (*1)	---	---	Continuous
pH Range Excursions Monthly Total Accumulated Time in Minutes	---	446 (*1)	---	---	Continuous
pH (Standard Units)	---	---	Report (*1) (Min)	Report (*1) (Max)	Continuous
Ammonia Nitrogen	Report	Report	Report	Report	1/week
Total Kjeldahl Nitrogen (TKN)	Report	Report	Report	Report	1/month
Nitrates/Nitrites	Report	Report	Report	Report	1/month
TSS	Report	Report	Report	Report	1/week
Fluoride	Report	Report	Report	Report	1/week
Sulfate	Report	Report	Report	Report	1/week
Total Phosphorous (as P)	Report	Report	Report	Report	1/week
Total Dissolved Phosphorous	Report	Report	Report	Report	1/month
Gross Alpha Particle Activity (*1)	---	---	Report	Report	1/month
Total Radium (*1)	Report	Report	0.4 pCi/ml	0.5 pCi/ml	1/month
Total Uranium	Report	Report	Report	Report	1/month
Toxic Priority Metals (*2)	Report	Report	Report	Report	1/month

Fact Sheet and Rationale for
Mosaic Fertilizer, LLC, Taft Plant
LA0003638, AI No. 2720
Page 8

PARAMETER(S)	MASS, LBS/DAY unless otherwise stated		CONCENTRATION, MG/L unless otherwise stated		MEASUREMENT FREQUENCY
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	
Total Aluminum	Report	Report	Report	Report	1/month
Total Cadmium	Report	Report	Report	Report	1/month
Flow, Weekly Volume & Internal Outfall 102	---	---	---	Report	1/day
Dock Discharges as P	Report	Report	---	---	1/week
Biomonitoring	---	---	Monthly Avg. Minimum Report	48-Hour Minimum Report	1/year, Both species

(*1) Mass units of pico-curies/day and concentration units of pico-curies/milliliter

(*2) Toxic Priority Metals consist of the total form of antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc.

Flow - this requirement has been established in accordance with LAC 33:IX.2707.I.1.b. and retained from the current LPDES permit effective on March 1, 2004. The continuous monitoring frequency has also been retained.

pH - this requirement has been established in accordance with LAC 33:IX.1113.C.1. and retained from the current LPDES permit effective on March 1, 2004. The continuous monitoring frequency has also been retained.

All other parameters and associated monitoring frequencies shall be retained from the current LPDES permit effective March 1, 2004 except for changes in monitoring frequencies noted in Section VIII.A. of this factsheet. These parameters were originally established in the NPDES permit effective September 4, 1987, for the purpose of data gathering based on potential pollutants present in raw phosphate rock. BPJ limitations were established in the 1987 NPDES permit for Total Radium. These limitations are now considered BAT for this facility.

Fact Sheet and Rationale for
Mosaic Fertilizer, LLC, Taft Plant
LA0003638, AI No. 2720
Page 9

Phosphoric Acid Production

IMC Phosphates Company, Taft Plant, ceased production of phosphoric acid, and subsequently dismantled the phosphoric acid plant. The Taft Plant has no intentions of producing phosphoric acid in the future. However it should be noted that the permit issued in the name of Beker Industries Corporation in 1987 established a Total Maximum Daily Load (TMDL) for total phosphorous mass based on a study of eutrophication in the Mississippi River for Outfall 002 (which at that time included, 102 - phosphoric acid process water, 202 - gypsum slurry water, 402 - gypsum pond decant and/or storm drainage, and 301 - treated or uncontaminated plant drainage). The relationship between the Total Phosphorous TMDL and river flow (Q) is based on the report "Evaluation and Projection of Water Quality Impacts from Nutrient Loading" (Figure 30, p. 48) published by the Department of Environmental Quality. The original formula established by the report is as follows:

$$\text{Phosphorous TMDL (lbs/day)} = 0.955602 \times Q(\text{cfs}) - 2.691175\text{E-}04.$$

Since the constant term ($2.691175\text{E-}04 = 0.0002691175$) was numerically insignificant, it was not considered in the formula used to assign permit limits. The loading was allocated among wet phosphoric acid plants on the Mississippi River. The Taft Plant's share was not the same as the other plants because of the unavailability of land to store gypsum.

The loading was set forth in Part II of the Beker (1987) permit for a series of river flows (*1). This total phosphorous water quality standard effluent limitation from the facility maintains the phosphorous content at levels to prevent algal blooms or other forms of eutrophication in the Mississippi River. This Water Quality Standards (WQS) Based limit is based upon the narrative standards in the Louisiana Surface Water Quality Standards, a matter of State Law, which must be incorporated into the permit pursuant to 40 CFR 122.44(d). The permittee was required to report the Mississippi River flows on a daily basis and report any violation of the phosphorous water quality standard based daily maximum limit.

- (*1)
- a) for Mississippi River flows below 200,000 cfs: 77,000 lbs/day
 - b) for Mississippi River flows $\geq 200,000$ cfs and $< 500,00$ cfs: 99,400 lbs/day
 - c) for Mississippi River flows $\geq 500,000$ cfs and $< 600,000$ cfs: 119,400 lbs/day
 - d) for Mississippi River flows $\geq 600,000$ cfs: 133,400 lbs/day

Discharge through Outfall 002 must cease, except for stormwater runoff, if the river falls and remains below 129,00 cfs for 7 consecutive days. Discharge may resume when the river flow exceeds 129,000 cfs.

Since the Taft Plant was no longer producing phosphoric acid at the time the permit was reissued in the name of Agrico Chemical Company in 1992, the TMDL allocation for phosphorous was not included in the permit. However, the

Fact Sheet and Rationale for
Mosaic Fertilizer, LLC, Taft Plant
LA0003638, AI No. 2720
Page 10

phosphorous allocation was held for the Taft Plant in the TMDL pending their potential ability to produce phosphoric acid if and when they solved the gypsum storage problem. This has been continued in the current draft permit.

Site-Specific Consideration(s)

None

2. Internal Outfall 102 - the intermittent discharge of stormwater runoff from the inactive calcium sulfate storage pile, and stormwater that has infiltrated the inactive calcium sulfate storage pile.

PARAMETER(S)	MASS, LBS/DAY unless otherwise stated		CONCENTRATION, MG/L unless otherwise stated		MEASUREMENT FREQUENCY
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	
Flow, MGD	Report	Report	---	---	3/week
pH (Standard Units)	---	---	Report (Min)	Report (Max)	1/week
Total Suspended Solids	---	---	90	180	1/week
Chemical Oxygen Demand	---	---	---	100	3/week
Oil and Grease	---	---	---	15	1/week
Fluoride	Report	Report	Report	Report	1/week
Total Phosphorous	Report	Report	Report	Report	1/week
Ammonia (as N)	Report	Report	Report	Report	1/week

The Inactive Gypsum Stack/Internal Outfall 102

In 1992, it was determined that the total phosphorous loading from the inactive gypsum stack could not approach the TMDL load allocation in the 1987 permit which was based on a 1600 tons per day P_2O_5 production rate. Their self-reporting data showed total phosphorous to range from zero, during dry weather, to about 3000 lbs/day. Thus the 1992 permit did not include the TMDL lbs/day effluent limitation for phosphorous. Because the phosphoric acid production unit has been dismantled, and the total phosphorous loading from the inactive gypsum stack cannot approach the TMDL load allocation in the 1987 permit, this permit will not include a lbs/day effluent limitation for phosphorous. Prior to 1992, the total suspended solids reported in the final combined effluent contained a daily average concentration of up to 700 mg/L.

Fact Sheet and Rationale for
Mosaic Fertilizer, LLC, Taft Plant
LA0003638, AI No. 2720
Page 11

This did not mean that the permittee was or was not discharging gypsum solids. However, a TSS limit of 90 mg/L (secondary treatment technology level, technology set forth in 40 CFR Part 133) for the effluent from the inactive gypsum stack was included in the 1992 permit. The TSS limitation is proposed to be continued in the draft permit.

Flow - this requirement has been established in accordance with LAC 33:IX.2707.I.1.b. and retained from the current LPDES permit effective on March 1, 2004. The 3/week monitoring frequency has also been retained.

pH - this requirement has been established in accordance with LAC 33:IX.1113.C.1. and retained from the current LPDES permit effective on March 1, 2004. 1/week monitoring frequency has been applied in accordance with Section VIII.C. of this factsheet.

All other parameters and associated monitoring frequencies shall be retained from the current LPDES permit effective March 1, 2004 except for changes in monitoring frequencies noted in Section VIII.C. of this factsheet.

3. Internal Outfall 202 - intermittent discharge of contaminated stormwater runoff from the phosphate fertilizer production area (when not operating), and (*1).

PARAMETER(S)	MASS, LBS/DAY unless otherwise stated		CONCENTRATION, MG/L unless otherwise stated		MEASUREMENT FREQUENCY
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM	
Flow, MGD	Report	Report	---	---	3/week
pH (Standard Units)	---	---	Report (Min)	Report (Max)	3/week
Chemical Oxygen Demand	---	---	---	100	1/week
Oil and Grease	---	---	---	15	1/week
Fluoride	---	---	25	75	1/week
Total Phosphorous	---	---	35	105	1/week
Ammonia (as N)	---	---	30	60	1/week

Fact Sheet and Rationale for
Mosaic Fertilizer, LLC, Taft Plant
LA0003638, AI No. 2720
Page 12

Flow - this requirement has been established in accordance with LAC 33:IX.2707.I.1.b. and retained from the current LPDES permit effective on March 1, 2004. The 3/week frequency has also been retained.

pH - this requirement has been established in accordance with LAC 33:IX.1113.C.1. and retained from the current LPDES permit effective on March 1, 2004. The 3/week monitoring frequency has also been retained.

All other parameters and associated monitoring frequencies shall be retained from the current LPDES permit effective March 1, 2004 except for changes in monitoring frequencies noted in Section VIII.D. of this factsheet.

C. WATER QUALITY-BASED EFFLUENT LIMITATIONS

Technology-based effluent limitations and/or specific analytical results from the permittee's application were screened against state water quality numerical standard based limits by following guidance procedures established in the Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, LDEQ, October 7, 2009. Calculations, results, and documentation are given in Appendix B.

In accordance with 40 CFR § 122.44 (d)(1)/LAC 33:IX.2707.D.1, the existing (or potential) discharge (s) was evaluated in accordance with the Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, LDEQ, October 7, 2009, to determine whether pollutants would be discharged "at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard." Calculations, results, and documentation are given in Appendix B.

The following pollutants received water quality based effluent limits:

<u>POLLUTANT(S)</u>
None (*1)

(*1) There is a total phosphorous water quality based limit assigned to this facility based on river flow. See Section IX.B.1, Phosphoric Acid Production. However, since the facility is not producing phosphoric acid and the current total phosphorous loading is significantly below the assigned total phosphorous from the TMDL, the TMDL allocation was not included in the permit. If the facility is able to solve their gypsum storage problem and resume phosphoric acid production, the permit shall be reopened to include total phosphorous values from the TMDL.

Minimum quantification levels (MQL's) for state water quality numerical standards-based effluent limitations are set at the values listed in the Permitting Guidance Document for Implementing Louisiana Surface Water Quality

Fact Sheet and Rationale for
Mosaic Fertilizer, LLC, Taft Plant
LA0003638, AI No. 2720
Page 13

Standards, LDEQ, October 7, 2009. They are also listed in Part II of the permit.

Site-Specific Consideration(s) Related to Water Quality in the Mississippi River Basin for Outfall 002

The LDEQ is aware of the occurrence of a low oxygen hypoxic or "dead zone" in the Gulf of Mexico and its relationship to nutrients and fresh water from the Mississippi River and has developed a criteria development plan for state waters in coordination with EPA to create defensible nutrient criteria based on the best available science. Work on criteria for the Mississippi River is an ongoing effort and will require further scientific investigation because of the complex nature of the large Mississippi River watershed which includes over 30 states and two Canadian Provinces. A reopener clause has been established in the permit in accordance with LAC 33:IX.2903 which allows LDEQ to modify, or alternatively, revoke and reissue the permit to comply with any more stringent nutrient limitations or requirements that are promulgated in the future.

TMDL Waterbodies

Subsegment No. 070301 of the Mississippi River Basin is not listed on LDEQ's 2006 Final Integrated 303(d) List as being impaired.

D. Biomonitoring Requirements

It has been determined that there may be pollutants present in the effluent which may have the potential to cause toxic conditions in the receiving stream. The State of Louisiana has established a narrative criteria which states, "toxic substances shall not be present in quantities that alone or in combination will be toxic to plant or animal life." The Office of Environmental Services requires the use of the most recent EPA biomonitoring protocols.

Whole effluent biomonitoring is the most direct measure of potential toxicity which incorporates both the effects of synergism of effluent components and receiving stream water quality characteristics. Biomonitoring of the effluent is, therefore, required as a condition of this permit to assess potential toxicity. The biomonitoring procedures stipulated as a condition of this permit for Outfall(s) 001 are as follows:

TOXICITY TESTS

Acute static renewal 48-hour
definitive toxicity test
using Daphnia pulex

FREQUENCY

1/year

Fact Sheet and Rationale for
Mosaic Fertilizer, LLC, Taft Plant
LA0003638, AI No. 2720
Page 14

Acute static renewal 48-hour
definitive toxicity test
using fathead minnow (Pimephales
promelas) 1/year

Toxicity tests shall be performed in accordance with protocols described in the latest revision of the "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms." The stipulated test species are appropriate to measure the toxicity of the effluent consistent with the requirements of the State water quality standards. The biomonitoring frequency has been established to reflect the likelihood of ambient toxicity and to provide data representative of the toxic potential of the facility's discharge in accordance with regulations promulgated at LAC 33:IX.2715/40 CFR Part 122.48.

Results of all dilutions as well as the associated chemical monitoring of pH, temperature, hardness, dissolved oxygen, conductivity, and alkalinity shall be documented in a full report according to the test method publication mentioned in the previous paragraph. The permittee shall submit a copy of the first full report to the Office of Environmental Compliance. The full report and subsequent reports are to be retained for three (3) years following the provisions of Part III.C.3 of this permit. The permit requires the submission of certain toxicity testing information as an attachment to the Discharge Monitoring Report.

This permit may be reopened to require effluent limits, additional testing, and/or other appropriate actions to address toxicity if biomonitoring data show actual or potential ambient toxicity to be the result of the permittee's discharge to the receiving stream or water body. Modification or revocation of the permit is subject to the provisions of LAC 33:IX.3105/40 CFR 124.5. Accelerated or intensified toxicity testing may be required in accordance with Section 308 of the Clean Water Act.

Dilution Series

The permit requires five (5) dilutions in addition to the control (0% effluent) to be used in the toxicity tests. These additional effluent concentrations shall be 0.13%, 0.10%, 0.074%, 0.056%, and 0.042%. The low-flow effluent concentration (critical dilution) is defined as 0.10% effluent. See recommendations at Appendix C.

X. Compliance History/DMR Review:

- A. LDEQ records were reviewed for the period of October 2007 through October 2009. There were no enforcement actions issued to this facility for any media during this time period.

Fact Sheet and Rationale for
Mosaic Fertilizer, LLC, Taft Plant
LA0003638, AI No. 2720
Page 15

- B. A DMR review of the monitoring reports covering the monitoring period of March 2004 through September 2009 revealed the following effluent excursions:

<u>DATE</u>	<u>PARAMETER</u>	<u>OUTFALL</u>	<u>REPORTED VALUE</u>		<u>PERMIT LIMITS</u>	
			<u>MONTHLY AVERAGE</u>	<u>DAILY MAXIMUM</u>	<u>MONTHLY AVERAGE</u>	<u>DAILY MAXIMUM</u>
03/05	pH	202	5.8 su (Min)		6.0 su (Min)	
09/05	COD	102		133 mg/L		100 mg/L
03/07	COD	102		105 mg/L		100 mg/L
09/08	COD	102		112 mg/L		100 mg/L

- C. The most recent inspection was conducted on March 19, 2009. There were no areas of concern noted in the inspection report.

XI. "IT" Questions - Applicant's Responses

This applicant is not required to submit "IT" Questions in accordance with La. R.S. 30:2018(A).

XII. Endangered Species:

The receiving waterbody, Subsegment 070301 of the Mississippi River Basin, has been identified by the U.S. Fish and Wildlife Service (FWS) as habitat for the Pallid Sturgeon, which is/are listed as a threatened and/or endangered species. This draft permit has been submitted to the FWS for review in accordance with a letter dated 01/11/10 from Rieck (FWS) to Nolan (LDEQ). As set forth in the Memorandum of Understanding between the LDEQ and the FWS, and after consultation with FWS, LDEQ has determined that the issuance of the LPDES permit is not likely to have an adverse effect upon the Pallid Sturgeon. The effluent limitations established in the permit ensure protection of aquatic life and maintenance of the receiving water as aquatic habitat. Therefore, the issuance of the LPDES permit is not likely to have an adverse effect on any endangered or candidate species or the critical habitat.

Fact Sheet and Rationale for
Mosaic Fertilizer, LLC, Taft Plant
LA0003638, AI No. 2720
Page 16

XIII. Historic Sites:

The discharge is from an existing facility location, which does not include an expansion on undisturbed soils. Therefore, there should be no potential effect to sites or properties on or eligible for listing on the National Register of Historic Places, and in accordance with the "Memorandum of Understanding for the Protection of Historic Properties in Louisiana Regarding LPDES Permits" no consultation with the Louisiana State Historic Preservation Officer is required.

XIV. Tentative Determination:

On the basis of preliminary staff review, the Department of Environmental Quality has made a tentative determination to reissue a permit for the discharge described in the application.

XV. Variances:

No requests for variances have been received by this Office.

XVI. Public Notices:

Upon publication of the public notice, a public comment period shall begin on the date of publication and last for at least 30 days thereafter. During this period, any interested persons may submit written comments on the draft permit and may request a public hearing to clarify issues involved in the permit decision at this Office's address on the first page of the fact sheet. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing.

Public notice published in:

Local newspaper of general circulation

Office of Environmental Services Public Notice Mailing List

Appendix A

wqsmoan.wk4 Date: 03/22 Appendix A-1 Page 1
 Developer: Bruce Fielding Time: 02:52 PM
 Software: Lotus 4.0 LA0003638, AI2720
 Revision date: 3/11/09

Water Quality Screen for Mosaic Fertilizer, LLC - Taft Plant

Input variables:

Receiving Water Characteristics: Dilution:
 ZID Fa = 0.033333
 Receiving Water Name= Mississippi River 070301
 Critical flow (Qr) cfs= 141955 MZ Fa = 0.333333
 Harm. mean/avg tidal cfs= 366748 Critical Qr (MGD)=91745.52
 Drinking Water=1 HHNPCR=2 1 Harm. Mean (MGD)= 237029.2
 MW=1, BW=2, 0=n ZID Dilution = 0.000987
 Rec. Water Hardness= 149.7 MZ Dilution = 0.000099
 Rec. Water TSS= 26.6 HHnc Dilution= 0.000033
 Fisch/Specific=1,Stream=0 HHc Dilution= 0.000013
 Diffuser Ratio= ZID Upstream = 1012.644
 MZ Upstream = 10126.44

Effluent Characteristics: MZhhnc Upstream= 30379.31
 Permittee= Mosaic Fertilizer, LLC - Taft Plant
 Permit Number= LA0003638, AI2720
 Facility flow (Qef),MGD= 3.02 MZhhc Upstream= 78486.5
 ZID Hardness= ---
 Outfall Number = 002 MZ Hardness= ---
 Eff. data, 2-lbs/day 2 ZID TSS= ---
 MQL, 2-lbs/day 1 MZ TSS= ---
 Effluent Hardness= N/A Multipliers:
 Effluent TSS= N/A WLAA --> LTAA 0.32
 WQBL ind. 0=y, 1=n WLAC --> LTAC 0.53
 Acute/Chr. ratio 0=n, 1=y 1 LTA a,c-->WQBL avg 1.31
 Aquatic,acute only1=y,0=n LTA a,c-->WQBL max 3.11
 LTA h --> WQBL max 2.38

Page Numbering/Labeling
 Appendix Appendix A-1
 Page Numbers 1=y, 0=n 1
 Input Page # 1=y, 0=n 1

Fischer/Site Specific inputs:
 Pipe=1,Canal=2,Specific=3
 Pipe width, feet
 ZID plume dist., feet
 MZ plume dist., feet
 HHnc plume dist., feet
 HHc plume dist., feet
 Conversions:
 ug/L-->lbs/day Qef0.025187
 ug/L-->lbs/day Qeo 0
 ug/L-->lbs/day Qr 1183.905
 lbs/day-->ug/L Qeo39.70334
 lbs/day-->ug/L Qef39.70334
 diss-->tot 1=y0=n 1
 Cu diss-->tot1=y0=n 1
 cfs-->MGD 0.6463

Fischer/site specific dilutions:
 F/specific ZID Dilution = --- Receiving Stream:
 F/specific MZ Dilution = --- Default Hardness= 25
 F/specific HHnc Dilution= --- Default TSS= 10
 F/specific HHc Dilution= --- 99 Crit., 1=y, 0=n 1
 Old MQL=1, New=0 1

Toxicity Dilution Series:
 Biomonitoring dilution: 0.000987
 Dilution Series Factor: 0.75

Percent Effluent
 Dilution No. 1 0.132%
 Dilution No. 2 0.098%
 Dilution No. 3 0.074%
 Dilution No. 4 0.055%
 Dilution No. 5 0.041%

Partition Coefficients; Dissolved-->Total

METALS	FW
Total Arsenic	2.164017
Total Cadmium	3.611111
Chromium III	5.227474
Chromium VI	1
Total Copper	3.440633
Total Lead	6.396776
Total Mercury	2.831954
Total Nickel	3.008608
Total Zinc	4.344833

Aquatic Life, Dissolved

Metal Criteria, ug/L

METALS	ACUTE	CHRONIC
Arsenic	339.8	150
Cadmium	49.23806	1.389057
Chromium III	763.6103	247.7073
Chromium VI	15.712	10.562
Copper	26.94809	17.34068
Lead	99.91352	3.893486
Mercury	1.734	0.012
Nickel	1991.218	221.1407
Zinc	161.091	147.1005

Site Specific Multiplier Values:

CV = ---
 N = ---
 WLAA --> LTAA ---
 WLAC --> LTAC ---
 LTA a,c-->WQBL avg ---
 LTA a,c-->WQBL max ---
 LTA h --> WQBL max ---

Appendix A-1

Page 2

Mosaic Fertilizer, LLC - Taft Plant

LA0003638, AI2720

(*1)	(*2)	(*3)	(*4)	(*5)	(*6)	(*7)	(*8)	(*9)	(*10)	(*11)
Toxic	CuEffluent Effluent		MQLEffluent		95th %		Numerical Criteria		HH	
Parameters	Instream	/Tech	/Tech	1=No	95%	estimate	Acute	Chronic	HHDW	Carcinogen
	Conc.	(Avg)	(Max)	0=95 %	Non-Tech		FW	FW	Indicator	
	ug/L	lbs/day	lbs/day	ug/L	lbs/day		ug/L	ug/L	ug/L	"C"
NONCONVENTIONAL										
Total Phenols (4AAP)				5			700	350	5	
3-Chlorophenol				10					0.1	
4-Chlorophenol				10			383	192	0.1	
2,3-Dichlorophenol				10					0.04	
2,5-Dichlorophenol				10					0.5	
2,6-Dichlorophenol				10					0.2	
3,4-Dichlorophenol				10					0.3	
2,4-Dichlorophenoc-										
acetic acid (2,4-D)				---					100	
2-(2,4,5-Trichlorophen-										
oxy) propionic acid										
(2,4,5-TP, Silvex)				---					10	
METALS AND CYANIDE										
Total Arsenic				10			735.3329	324.6025	108.2008	
Total Cadmium		0.12		1	0	0.2556	177.8041	5.01604	36.11111	
Chromium III				10			3991.753	1294.884	261.3737	
Chromium VI				10			15.712	10.582	50	C
Total Copper				10			92.71849	59.66292	3440.633	
Total Lead				5			639.1244	24.90576	319.8388	
Total Mercury				0.2			4.910608	0.033983	5.663908	
Total Nickel				40			5990.794	665.3257		
Total Zinc				20			699.9135	639.1272	21724.17	
Total Cyanide				20			45.9	5.4	663.8	
DIOXIN										
2,3,7,8 TCDD; dioxin				0.00001					7.1E-007	C
VOLATILE COMPOUNDS										
Benzene				10			2249	1125	1.1	C
Bromoform				10			2930	1465	3.9	C
Bromodichloromethane				10					0.2	C
Carbon Tetrachloride				10			2730	1365	0.22	C
Chloroform				10			2890	1445	5.3	C
Dibromochloromethane				10					0.39	C
1,2-Dichloroethane				10			11800	5900	0.36	C
1,1-Dichloroethylene				10			1160	580	0.05	C
1,3-Dichloropropylene				10			606	303	9.86	
Ethylbenzene				10			3200	1600	2390	
Methyl Chloride				50			55000	27500		
Methylene Chloride				20			19300	9650	4.4	C
1,1,2,2-Tetrachloro-										
ethane				10			932	466	0.16	C

Appendix A-1

Page 3

Mosaic Fertilizer, LLC - Taft Plant
LA0003638, AI2720

(*1)	(*12)	(*13)	(*14)	(*15)	(*16)	(*17)	(*18)	(*19)	(*20)	(*21)	(*22)	(*23)
Toxic	WLAa	WLAc	WLAh	LTAa	LTAc	LTAh	Limiting	WQBL	WQBL	WQBL	WQBL	
Parameters	Acute	Chronic	HHDW	Acute	Chronic	HHDW	A,C,HH	Avg	Max	Avg	Max	Need
								002	002	002	002	
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	lbs/day	lbs/day	
NONCONVENTIONAL												
Total Phenols (4AAP)	709550.6	3544603	151901.6	227056.2	1878640	151901.6	151901.6	151901.6	361525.7	3825.914	9105.675	no
3-Chlorophenol	---	---	3038.031	---	---	3038.031	3038.031	3038.031	7230.514	76.51828	182.1135	no
4-Chlorophenol	388225.5	1944468	3038.031	124232.2	1030568	3038.031	3038.031	3038.031	7230.514	76.51828	182.1135	no
2,3-Dichlorophenol	---	---	1215.212	---	---	1215.212	1215.212	1215.212	2892.206	30.60731	72.8454	no
2,5-Dichlorophenol	---	---	15190.16	---	---	15190.16	15190.16	15190.16	36152.57	382.5914	910.5675	no
2,6-Dichlorophenol	---	---	6076.062	---	---	6076.062	6076.062	6076.062	14461.03	153.0366	364.227	no
3,4-Dichlorophenol	---	---	9114.093	---	---	9114.093	9114.093	9114.093	21691.54	229.5548	546.3405	no
2,4-Dichlorophenoc-												
acetic acid (2,4-D)	---	---	3038031	---	---	3038031	3038031	3038031	7230514	76518.28	182113.5	no
2-(2,4,5-Trichlorophen-												
oxy) propionic acid												
(2,4,5-TP, Silvex)	---	---	303803.1	---	---	303803.1	303803.1	303803.1	723051.4	7651.828	18211.35	no
METALS AND CYANIDE												
Total Arsenic	745365.6	3287392	3287175	238517	1742318	3287175	238517	312457.2	741787.8	7869.798	18683.26	no
Total Cadmium	180230	50799.62	1097067	57673.61	26923.8	1097067	26923.8	35270.18	83733.02	888.3429	2108.967	no
Chromium III	4046216	1.3E+007	7940615	1294789	6950341	7940615	1294789	1696174	4026794	42721.18	101422	no
Chromium VI	15926.37	107168.5	3924375	5096.438	56799.32	3924375	5096.438	6676.334	15849.92	168.1555	399.2088	no
Total Copper	93983.51	604232.5	1E+008	30074.72	320243.2	1E+008	30074.72	39397.89	93532.39	992.3067	2355.782	no
Total Lead	647844.4	252231.5	9716801	207310.2	133682.7	9716801	133682.7	175124.3	415753.2	4410.821	10471.49	no
Total Mercury	4977.607	344.1652	172071.3	1592.834	182.4076	172071.3	182.4076	238.9539	567.2875	6.018484	14.28816	no
Total Nickel	6072531	6738044	---	1943210	3571164	---	1943210	2545605	6043382	64115.64	152213.5	no
Total Zinc	709462.9	6472720	6.6E+008	227028.1	3430542	6.6E+008	227028.1	297406.9	706057.5	7490.727	17783.33	no
Total Cyanide	46526.24	54688.16	2E+007	14888.4	28984.72	2E+007	14888.4	19503.8	46302.92	491.2384	1166.222	no
DIOXIN												
2,3,7,8 TCDD; dioxin	---	---	0.055726	---	---	0.055726	0.055726	0.055726	0.132628	0.001404	0.00334	no
VOLATILE COMPOUNDS												
Benzene	2279685	1.1E+007	86336.25	729499.1	6038484	86336.25	86336.25	86336.25	205480.3	2174.534	5175.391	no
Bromoform	2969976	1.5E+007	306101.3	950392.3	7863448	306101.3	306101.3	306101.3	728521	7709.711	18349.11	no
Bromodichloromethane	---	---	15697.5	---	---	15697.5	15697.5	15697.5	37360.05	395.3698	940.9801	no
Carbon Tetrachloride	2767247	1.4E+007	17267.25	885519.1	7326694	17267.25	17267.25	17267.25	41096.06	434.9068	1035.078	no
Chloroform	2929430	1.5E+007	415983.8	937417.7	7756097	415983.8	415983.8	415983.8	990041.3	10477.3	24935.97	no
Dibromochloromethane	---	---	30610.13	---	---	30610.13	30610.13	30610.13	72852.1	770.9711	1834.911	no
1,2-Dichloroethane	1.2E+007	6E+007	28255.5	3827518	3.2E+007	28255.5	28255.5	28255.5	67248.09	711.6656	1693.764	no
1,1-Dichloroethylene	1175827	5873913	3924.375	376264.5	3113174	3924.375	3924.375	3924.375	9340.013	98.84245	235.245	no
1,3-Dichloropropylene	614268.1	3068613	299549.9	196565.8	1626365	299549.9	196565.8	257501.2	611319.6	6485.631	15397.18	no
Ethylbenzene	3243660	1.6E+007	7.3E+007	1037971	8588066	7.3E+007	1037971	1359742	3228090	34247.55	81305.26	no
Methyl Chloride	5.6E+007	2.8E+008	---	1.8E+007	1.5E+008	---	1.8E+007	2.3E+007	5.5E+007	588629.8	1397434	no
Methylene Chloride	2E+007	9.8E+007	345345	6260263	5.2E+007	345345	345345	345345	821921.1	8698.136	20701.56	no
1,1,2,2-Tetrachloro-												
ethane	944715.9	4719386	12558	302309.1	2501274	12558	12558	12558	29888.04	316.2958	752.7841	no

[illegible]

(+1)	(+12)	(+13)	(+14)	(+15)	(+16)	(+17)	(+18)	(+19)	(+20)	(+21)	(+22)	(+23)
Toxic Parameters	WLAa	WLAc	WLAh	LTAA	LTAC	LTAA	Limiting	WQBL	WQBL	WQBL	WQBL	Need
	Acute	Chronic	HHDW	Acute	Chronic	HHDW	A,C,HH	Avg	Max	Avg	Max	WQBL?
	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	lbs/day	lbs/day	
								002	002	002	002	
Tetrachloroethylene	1307600	6532197	51016.88	418432.1	3462064	51016.88	51016.88	51016.88	121420.2	1284.952	3058.185	no
Toluene	1287327	6430922	1.9E+008	411944.8	3408389	1.9E+008	411944.8	539647.7	1281148	13592	32268.03	no
1,1,1-Trichloroethane	5352039	2.7E+007	6076062	1712652	1.4E+007	6076062	1712652	2243575	5326349	56508.46	134153.7	no
1,1,2-Trichloroethane	1824559	9114693	43953	583858.8	4830787	43953	43953	43953	104608.1	1107.035	2634.744	no
Trichloroethylene	3953210	2E+007	219765	1265027	1E+007	219765	219765	219765	523040.7	5535.177	13173.72	no
Vinyl Chloride	---	---	149126.3	---	---	149126.3	149126.3	149126.3	354920.5	3756.013	8939.311	no
ACID COMPOUNDS												
2-Chlorophenol	261520.1	1306439	3038.031	83686.42	692412.8	3038.031	3038.031	3038.031	7230.514	76.51828	182.1135	no
2,4-Dichlorophenol	204756	1022871	9114.093	65521.93	542121.7	9114.093	9114.093	9114.093	21691.54	229.5548	546.3405	no
BASE NEUTRAL COMPOUNDS												
Benzidine	253410.9	1265930	6.279	81091.49	670942.7	6.279	6.279	6.279	14.94402	0.158148	0.376392	no
Hexachlorobenzene	---	---	19.62188	---	---	19.62188	19.62188	19.62188	46.70006	0.494212	1.176225	no
Hexachlorabutadiene	5169.583	10329.99	7063.875	1654.266	5474.892	7063.875	1654.266	2167.089	5144.769	54.58204	129.5803	no
PESTICIDES												
Aldrin	3040.931	---	3.1395	973.0979	---	3.1395	3.1395	3.1395	7.47201	0.079074	0.188196	no
Hexachlorocyclohexane (gamma BHC, Lindane)	5372.311	2126.762	8633.625	1719.14	1127.184	8633.625	1127.184	1476.611	3505.541	37.1911	88.29337	no
Chlordane	2432.745	43.54798	14.91263	778.4783	23.08043	14.91263	14.91263	14.91263	35.49205	0.375601	0.893931	no
4,4'-DDT	1115.008	10.12744	14.91263	356.8026	5.367541	14.91263	5.367541	7.031479	16.69305	0.1771	0.420445	no
4,4'-DDE	53216.29	106338.1	14.91263	17029.21	56359.19	14.91263	14.91263	14.91263	35.49205	0.375601	0.893931	no
4,4'-DDD	30.40931	60.76462	21.19163	9.730979	32.20525	21.19163	9.730979	12.74758	30.26335	0.321071	0.762237	no
Dieldrin	240.639	564.0982	3.924375	77.00448	298.9721	3.924375	3.924375	3.924375	9.340013	0.098842	0.235245	no
Endosulfan	223.0016	567.1365	14278.75	71.36051	300.5823	14278.75	71.36051	93.48227	221.9312	2.354519	5.589737	no
Endrin	87.57881	379.7789	7898.881	28.02522	201.2828	7898.881	28.02522	36.71304	87.15843	0.924684	2.195242	no
Heptachlor	527.0947	38.48426	5.494125	168.6703	20.39666	5.494125	5.494125	5.494125	13.07602	0.138379	0.329343	no
Toxaphene	739.9599	2.025487	18.837	236.7872	1.073508	18.837	1.073508	1.406296	3.338611	0.03542	0.084089	no
Other Parameters:												
Fecal Col. (col/100ml)	---	---	---	---	---	---	---	---	---	---	---	no
Chlorine	19259.23	111401.8	---	6162.954	59042.96	---	6162.954	8073.469	19166.79	203.3449	482.75	no
Ammonia	---	---	---	---	---	---	---	---	---	---	---	no
Chlorides	---	---	---	---	---	---	---	---	---	---	---	no
Sulfates	---	---	---	---	---	---	---	---	---	---	---	no
TDS	---	---	---	---	---	---	---	---	---	---	---	no

APPENDIX A-2 LA0003638, AI No. 2720

Documentation and Explanation of Water Quality Screen
and Associated Lotus Spreadsheet

Each reference column is marked by a set of parentheses enclosing a number and asterisk, for example (*1) or (*19). These columns represent inputs, existing data sets, calculation points, and results for determining Water Quality Based Limits for an effluent of concern. The following represents a summary of information used in calculating the water quality screen:

Receiving Water Characteristics:

Receiving Water: Mississippi River
Critical Flow, Qrc (cfs): 141,955
Harmonic Mean Flow, Qrh (cfs): 366,748
Segment No.: 070301
Receiving Stream Hardness (mg/L): 149.7
Receiving Stream TSS (mg/L): 26.6
MZ Stream Factor, Fs: 1/3
Plume distance, Pf: N/A

Effluent Characteristics:

Company: Mosaic Fertilizer, LLC - Taft Plant
Facility flow, Qe (MGD): 3.02
Effluent Hardness: N/A
Effluent TSS: N/A
Pipe/canal width, Pw: N/A
Permit Number: LA0003638

Variable Definition:

Qrc, critical flow of receiving stream, cfs
Qrh, harmonic mean flow of the receiving stream, cfs
Pf = Allowable plume distance in feet, specified in LAC 33:IX.1115.D
Pw = Pipe width or canal width in feet
Qe, total facility flow, MGD
Fs, stream factor from LAC.33.IX Chapter 11 (1 for harmonic mean flow)
Cu, ambient concentration, ug/L
Cr, numerical criteria from LAC.33.IX.1113, Table 1
WLA, wasteload allocation
LTA, long term average calculations
WQBL, effluent water quality based limit
ZID, Zone of Initial Dilution in % effluent
MZ, Mixing Zone in % effluent

Formulas used in aquatic life water quality screen (dilution type WLA):

Streams:

$$\text{Dilution Factor} = \frac{Q_e}{(Q_{rc} \times 0.6463 \times F_s + Q_e)}$$

Appendix A-2

LA0003638, AI No. 2720

Page 2

$$WLA_{a,c,h} = \frac{Cr}{\text{Dilution Factor}} - \frac{(Fs \times Q_{rc} \times 0.6463 \times Cu)}{Q_e}$$

Static water bodies (in the absence of a site specific dilution):

Discharge from a pipe:

Discharge from a canal:

$$\begin{array}{l} \text{Critical} \\ \text{Dilution} = \frac{(2.8) P_w n^{1/2}}{P_f} \end{array}$$

$$\begin{array}{l} \text{Critical} \\ \text{Dilution} = \frac{(2.38) (P_w^{1/2})}{(P_f)^{1/2}} \end{array}$$

$$WLA = \frac{(Cr-Cu) P_f}{(2.8) P_w n^{1/2}}$$

$$WLA = \frac{(Cr-Cu) P_f^{1/2}}{2.38 P_w^{1/2}}$$

Formulas used in human health water quality screen, human health non-carcinogens (dilution type WLA):

Streams:

$$\text{Dilution Factor} = \frac{Q_e}{(Q_{rc} \times 0.6463 + Q_e)}$$

$$WLA_{a,c,h} = \frac{Cr}{\text{Dilution Factor}} - \frac{(Q_{rc} \times 0.6463 \times Cu)}{Q_e}$$

Formulas used in human health water quality screen, human health carcinogens (dilution type WLA):

$$\text{Dilution Factor} = \frac{Q_e}{(Q_{rh} \times 0.6463 + Q_e)}$$

$$WLA_{a,c,h} = \frac{Cr}{\text{Dilution Factor}} - \frac{(Q_{rh} \times 0.6463 \times Cu)}{Q_e}$$

Static water bodies in the absence of a site specific dilution (human health carcinogens and human health non-carcinogens):

Discharge from a pipe:

Discharge from a canal:

$$\begin{array}{l} \text{Critical} \\ \text{Dilution} = \frac{(2.8) P_w n^{1/2}}{P_f} \end{array}$$

$$\begin{array}{l} \text{Critical} \\ \text{Dilution} = \frac{(2.38) (P_w^{1/2})}{(P_f)^{1/2}} \end{array}$$

$$WLA = \frac{(Cr-Cu) P_f^*}{(2.8) P_w n^{1/2}}$$

$$WLA = \frac{(Cr-Cu) P_f^{1/2*}}{2.38 P_w^{1/2}}$$

* P_f is set equal to the mixing zone distance specified in LAC 33:IX.1115 for the static water body type, i.e., lake, estuary, Gulf of Mexico, etc.

Appendix A-2

LA0003638, AI No. 2720

Page 3

If a site specific dilution is used, WLA are calculated by subtracting Cu from Cr and dividing by the site specific dilution for human health and aquatic life criteria.

$$WLA = \frac{(Cr - Cu)}{\text{site specific dilution}}$$

Long Term Average Calculations:

$$LTAA = WLAa \times 0.32$$

$$LTAc = WLAc \times 0.53$$

$$LTAh = WLAh$$

WQBL Calculations:

Select most limiting LTA to calculate daily max and monthly avg WQBL

If aquatic life LTA is more limiting:

$$\text{Daily Maximum} = \text{Min}(LTAA, LTAc) \times 3.11$$

$$\text{Monthly Average} = \text{Min}(LTAc, LTAh) \times 1.31$$

If human health LTA is more limiting:

$$\text{Daily Maximum} = LTAh \times 2.38$$

$$\text{Monthly Average} = LTAh$$

Mass Balance Formulas:

$$\text{mass (lbs/day)}: (\text{ug/L}) \times 1/1000 \times (\text{flow, MGD}) \times 8.34 = \text{lbs/day}$$

$$\text{concentration(ug/L)}: \frac{\text{lbs/day}}{(\text{flow, MGD}) \times 8.34 \times 1/1000} = \text{ug/L}$$

The following is an explanation of the references in the spreadsheet.

- (*1) Parameter being screened.
- (*2) Instream concentration for the parameter being screened in ug/L. In the absence of accurate supporting data, the instream concentration is assumed to be zero (0).
- (*3) Monthly average effluent or technology value in concentration units of ug/L or mass units of lbs/day. Units determined on a case-by-case basis as appropriate to the particular situation.
- (*4) Daily maximum technology value in concentration units of ug/L or mass units of lbs/day. Units determined on a case-by-case basis as appropriate to the particular situation.
- (*5) Minimum analytical Quantification Levels (MQLs). Established in a letter dated January 27, 1994 from Wren Stenger of EPA Region 6 to Kilren Vidrine of LDEQ and from the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". The applicant must test for the parameter at a level at least as sensitive as the specified MQL. If this is not done, the MQL becomes the application value for screening purposes if the pollutant is suspected to be present

Appendix A-2

LA0003638, AI No. 2720

Page 4

on-site and/or in the waste stream. Units are in ug/l or lbs/day depending on the units of the effluent data.

- (*6) States whether effluent data is based on 95th percentile estimation. A "1" indicates that a 95th percentile approximation is being used, a "0" indicates that no 95th percentile approximation is being used.
- (*7) 95th percentile approximation multiplier (2.13). The constant, 2.13, was established in memorandum of understanding dated October 8, 1991 from Jack Ferguson of Region 6 to Jesse Chang of LDEQ and included in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". This value is screened against effluent Water Quality Based Limits established in columns (*18) - (*21). Units are in ug/l or lbs/day depending on the units of the measured effluent data.
- (*8) LAC 33.IX.1113.C.6, Table 1, Numerical Criteria for Specific Toxic Substances, freshwater (FW) or marine water (MW) (whichever is applicable) aquatic life protection, acute criteria. Units are specified. Some metals are hardness dependent. The hardness of the receiving stream shall generally be used, however a flow weighted hardness may be determined in site-specific situations. Dissolved metals are converted to Total metals using partition coefficients in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Similar to hardness, the TSS of the receiving stream shall generally be used, however, a flow weighted TSS may be determined in site-specific situations.

Hardness Dependent Criteria:

<u>Metal</u>	<u>Formula</u>
Cadmium	$e^{(1.1280[\ln(\text{hardness})] - 1.6774)}$
Chromium III	$e^{(0.8190[\ln(\text{hardness})] + 3.6880)}$
Copper	$e^{(0.9422[\ln(\text{hardness})] - 1.3884)}$
Lead	$e^{(1.2730[\ln(\text{hardness})] - 1.4600)}$
Nickel	$e^{(0.8460[\ln(\text{hardness})] + 3.3612)}$
Zinc	$e^{(0.8473[\ln(\text{hardness})] + 0.8604)}$

Dissolved to Total Metal Multipliers for Freshwater Streams (TSS dependent):

<u>Metal</u>	<u>Multiplier</u>
Arsenic	$1 + 0.48 \times \text{TSS}^{-0.73} \times \text{TSS}$
Cadmium	$1 + 4.00 \times \text{TSS}^{-1.13} \times \text{TSS}$
Chromium III	$1 + 3.36 \times \text{TSS}^{-0.93} \times \text{TSS}$
Copper	$1 + 1.04 \times \text{TSS}^{-0.74} \times \text{TSS}$
Lead	$1 + 2.80 \times \text{TSS}^{-0.80} \times \text{TSS}$
Mercury	$1 + 2.90 \times \text{TSS}^{-1.14} \times \text{TSS}$
Nickel	$1 + 0.49 \times \text{TSS}^{-0.57} \times \text{TSS}$
Zinc	$1 + 1.25 \times \text{TSS}^{-0.70} \times \text{TSS}$

Dissolved to Total Metal Multipliers for Marine Environments (TSS dependent):

<u>Metal</u>	<u>Multiplier</u>
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Appendix A-2

LA0003638, AI No. 2720

Page 5

Copper	$1 + (10^{4.86} \times \text{TSS}^{-0.72} \times \text{TSS}) \times 10^{-6}$
Lead	$1 + (10^{6.06} \times \text{TSS}^{-0.85} \times \text{TSS}) \times 10^{-6}$
Zinc	$1 + (10^{5.36} \times \text{TSS}^{-0.52} \times \text{TSS}) \times 10^{-6}$

If a metal does not have multiplier listed above, then the dissolved to total metal multiplier shall be 1.

- (*9) LAC 33.IX.1113.C.6, Table 1, Numerical Criteria for Specific Toxic Substances, freshwater (FW) or marine water (MW) (whichever is applicable) aquatic life protection, chronic criteria. Units are specified. Some metals are hardness dependent. The hardness of the receiving stream shall generally be used, however a flow weighted hardness may be determined in site-specific situations. Dissolved metals are converted to Total metals using partition coefficients in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Similar to hardness, the TSS of the receiving stream shall generally be used, however, a flow weighted TSS may be determined in site-specific situations.

Hardness dependent criteria:

<u>Metal</u>	<u>Formula</u>
Cadmium	$e^{(0.7852[\ln(\text{hardness})] - 3.4900)}$
Chromium III	$e^{(0.8473[\ln(\text{hardness})] + 0.7614)}$
Copper	$e^{(0.8545[\ln(\text{hardness})] - 1.3860)}$
Lead	$e^{(1.2730[\ln(\text{hardness})] - 4.7050)}$
Nickel	$e^{(0.8460[\ln(\text{hardness})] + 1.1645)}$
Zinc	$e^{(0.8473[\ln(\text{hardness})] + 0.7614)}$

Dissolved to total metal multiplier formulas are the same as (*8), acute numerical criteria for aquatic life protection.

- (*10) LAC 33.IX.1113.C.6, Table 1, Numerical Criteria for Specific Toxic Substances, human health protection, drinking water supply (HHDW), non-drinking water supply criteria (HHNDW), or human health non-primary contact recreation (HHNPCR) (whichever is applicable). A DEQ and EPA approved Use Attainability Analysis is required before HHNPCR is used, e.g., Monte Sano Bayou. Units are specified.
- (*11) C if screened and carcinogenic. If a parameter is being screened and is carcinogenic a "C" will appear in this column.
- (*12) Wasteload Allocation for acute aquatic criteria (WLAA). Dilution type WLAA is calculated in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Negative values indicate that the receiving water is not meeting the acute aquatic numerical criteria for that parameter. Units are in ug/L.

Dilution WLAA formulas for streams:

$$\text{WLAA} = (\text{Cr}/\text{Dilution Factor}) - \frac{(\text{Fs} \times \text{Orc} \times 0.6463 \times \text{Cu})}{\text{Qe}}$$

Dilution WLAA formulas for static water bodies:

$$\text{WLAA} = (\text{Cr}-\text{Cu})/\text{Dilution Factor}$$

Cr represents aquatic acute numerical criteria from column (*8).

If Cu data is unavailable or inadequate, assume Cu=0.

Appendix A-2

LA0003638, AI No. 2720

Page 6

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then a blank shall appear in this column.

- (*13) Wasteload Allocation for chronic aquatic criteria (WLAc). Dilution type WLAc is calculated in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Negative values indicate that the receiving water is not meeting the chronic aquatic numerical criteria for that parameter. Units are in ug/L.

Dilution WLAc formula:

$$WLAc = (Cr/Dilution\ Factor) - \frac{(Fs \times Qrc \times 0.6463 \times Cu)}{Qc}$$

Dilution WLAc formulas for static water bodies:

$$WLAc = (Cr-Cu)/Dilution\ Factor)$$

Cr represents aquatic chronic numerical criteria from column (*9).

If Cu data is unavailable or inadequate, assume Cu=0.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then a blank shall appear in this column.

- (*14) Wasteload Allocation for human health criteria (WLAh). Dilution type WLAh is calculated in accordance with the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards". Negative values indicate that the receiving water is not meeting the human health numerical criteria for that parameter. Units are in ug/L. Dilution

WLAh formula:

$$WLAh = (Cr/Dilution\ Factor) - \frac{(Fs \times Qrc \times Qrh \times 0.6463 \times Cu)}{Qc}$$

Dilution WLAh formulas for static water bodies:

$$WLAh = (Cr-Cu)/Dilution\ Factor)$$

Cr represents human health numerical criteria from column (*10).

If Cu data is unavailable or inadequate, assume Cu=0.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then a blank shall appear in this column.

- (*15) Long Term Average for aquatic numerical criteria (LTAA). WLAa numbers are multiplied by a multiplier specified in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards" which is 0.32. WLAa X 0.32 = LTAA.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then a blank shall appear in this column.

- (*16) Long Term Average for chronic numerical criteria (LTAc). WLAc numbers are multiplied by a multiplier specified in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards" which is 0.53. WLAc X 0.53 = LTAc.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then a blank shall appear in this column.

- (*17) Long Term Average for human health numerical criteria (LTAh). WLAh numbers are multiplied by a multiplier specified in the "Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards" which is 1. WLAh X 1 = LTAh.

If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then a blank shall appear in this column.

- (*18) Limiting Acute, Chronic or Human Health LTA's. The most limiting LTA is placed in this column. Units are consistent with the WLA calculation.

Appendix A-2

LA0003638, AI No. 2720

Page 7

If standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then the type of limit, Aquatic or Human Health (HH), is indicated.

- (*19) End of pipe Water Quality Based Limit (WQBL) monthly average in terms of concentration, ug/L. If aquatic life criteria was the most limiting LTA then the limiting LTA is multiplied by 1.31 to determine the average WQBL ($LTA_{\text{limiting aquatic}} \times 1.31 = WQBL_{\text{monthly average}}$). If human health criteria was the most limiting criteria then $LTA_{\text{h}} = WQBL_{\text{monthly average}}$. If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then either the human health criteria or the chronic aquatic life criteria shall appear in this column depending on which is more limiting.
- (*20) End of pipe Water Quality Based Limit (WQBL) daily maximum in terms of concentration, ug/L. If aquatic life criteria was the most limiting LTA then the limiting LTA is multiplied by 3.11 to determine the daily maximum WQBL ($LTA_{\text{limiting aquatic}} \times 3.11 = WQBL_{\text{daily max}}$). If human health criteria was the most limiting criteria then LTA_{h} is multiplied by 2.38 to determine the daily maximum WQBL ($LTA_{\text{limiting aquatic}} \times 2.38 = WQBL_{\text{daily max}}$). If water quality standards are being applied at end-of-pipe, such as in the case of certain TMDLs, then either the human health criteria or the acute aquatic life criteria shall appear in this column depending on which is more limiting.
- (*21) End of pipe Water Quality Based Limit (WQBL) monthly average in terms of mass, lbs/day. The mass limit is determined by using the mass balance equations above. $\text{Monthly average WQBL, ug/l/1000} \times \text{facility flow, MGD} \times 8.34 = \text{monthly average WQBL, lbs/day}$.
- (*22) End of pipe Water Quality Based Limit (WQBL) monthly average in terms of mass, lbs/day. Mass limit is determined by using the mass balance equations above. $\text{Daily maximum WQBL, ug/l/1000} \times \text{facility flow, MGD} \times 8.34 = \text{daily maximum WQBL, lbs/day}$.
- (*23) Indicates whether the screened effluent value(s) need water quality based limits for the parameter of concern. A "yes" indicates that a water quality based limit is needed in the permit; a "no" indicates the reverse.

Appendix B

MEMORANDUM

TO: Sonja Loyd

FROM: Todd Franklin

DATE: November 10, 2009

RE: Stream Flow and Water Quality Characteristics for the Mississippi River, receiving waters for Mosaic Fertilizer, LLC / Taft Plant (Permit No. LA0003638, AI 2720)

The discharge flows into the Mississippi River. Ambient data for hardness and TSS was taken from ambient monitoring station #0321 (Mississippi River south of Lusher, Louisiana). The following results were obtained:

Average hardness = 149.7 mg/l
15th percentile TSS = 26.6 mg/l

Based on historical data, the 7Q10 on the Mississippi River at this location has been determined to be 141,955 cfs and the harmonic mean has been determined to be 366,748 cfs.

If you have additional questions or comments, please contact me at 2-3138.

Appendix C

BIOMONITORING FREQUENCY RECOMMENDATION AND RATIONALE FOR ADDITIONAL REQUIREMENTS

Permit Number: **LA0003638**
 Facility Name: **Mosaic Fertilizer, LLC, Taft Plant**
 Previous Critical Biomonitoring Dilution: **0.046% (10:1 ACR)**
 Proposed Critical Biomonitoring Dilution: **0.10% (10:1 ACR)**
 Outfall Discharge Flow: **3.02 MGD**
 Receiving stream 7Q10: **141,955 cfs**
 Date of Review: **11/13/09**
 Name of Reviewer: **Laura Thompson**

Recommended Frequency by Species:

Pimephales promelas (Fathead minnow): **Once/Year¹**
Daphnia pulex (water flea): **Once/Year¹**

Recommended Dilution Series: **0.042%, 0.056%, 0.074%, 0.10%, and 0.13%**

Number of Tests Performed during previous 5 years by Species:

Pimephales promelas (Fathead minnow): **6**
Daphnia pulex (water flea): **6**
Ceriodaphnia dubia (water flea): **N/A – Testing of species was not required**

Number of Failed Tests during previous 5 years by Species:

Pimephales promelas (Fathead minnow): **No failures on file during the past 5 years**
Daphnia pulex (water flea): **No failures on file during the past 5 years**
Ceriodaphnia dubia (water flea): **N/A – Testing of species was not required**

Failed Test Dates during previous 5 years by Species:

Pimephales promelas (Fathead minnow): **No failures on file during the past 5 years**
Daphnia pulex (water flea): **No failures on file during the past 5 years**
Ceriodaphnia dubia (water flea): **N/A – Testing of species was not required**

¹ An acute biomonitoring critical dilution of less than 1% shall have an established biomonitoring frequency of once per year.

FRESHWATER ACUTE

Previous TRE Activities:

N/A – No previous TRE Activities

Additional Requirements (including WET Limits) Rationale / Comments Concerning Permitting:

The Mosaic Fertilizer, LLC, Taft Plant owns and operates a diammonium phosphate fertilizer plant in Hahnville, St. Charles Parish, Louisiana. LPDES Permit LA0003638, effective March 1, 2004, contained freshwater acute biomonitoring as an effluent characteristic of Outfall 002 for *Daphnia pulex* and *Pimephales promelas*. The effluent series consisted of 0.019%, 0.026%, 0.034%, 0.046%, and 0.061% concentrations, with the critical biomonitoring dilution being defined as the 0.046% effluent concentration. The testing was to be performed once per quarter for the *Daphnia pulex* and the *Pimephales promelas*. Data on file indicate that the permittee has complied with the biomonitoring requirements contained in LA0003638 with no toxicity failures during the last five years.

It is recommended that freshwater acute biomonitoring continue to be an effluent characteristic of Outfall 002 (intermittent discharge of 3.02 mgd) in LA0003638. The effluent dilution series shall be 0.042%, 0.056%, 0.074%, 0.10%, and 0.13% concentrations, with 0.10% being defined as the critical biomonitoring dilution (the 10:1 Acute-to-Chronic ratio has been implemented). Since the proposed critical biomonitoring dilution is less than 1% (10:1 ACR), the biomonitoring frequency shall be once per year for *Daphnia pulex* and *Pimephales promelas*.

This recommendation is in accordance with the LDEQ/OES Permitting Guidance Document for Implementing Louisiana Surface Water Quality Standards, Water Quality Management Plan Volume 3. Version 6, and the Best Professional Judgment (BPJ) of the reviewer.